



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2007-0051; Directorate Identifier 2007-NE-37-AD]**

**RIN 2120-AA64**

**Airworthiness Directives;** Continental Motors, Inc. Reciprocating Engines with Superior Air Parts, Inc. (SAP) Cylinder Assemblies Installed

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to supersede an existing airworthiness directive (AD) that applies to certain Continental Motors, Inc. (CMI) IO-520, TSIO-520, and IO-550 series reciprocating engines, with certain replacement parts manufacturer approval (PMA) SAP investment cast cylinder assemblies installed. The existing AD currently requires initial and repetitive inspections and compression tests to detect cracks in those cylinders. Since we issued that AD, we became aware of additional engines that need to be added to the applicability. We are proposing this AD to prevent the separation of the cylinder head, damage to the engine, and damage to the airplane.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this AD, contact Continental Motors, Inc., 2039 Broad St., Mobile, AL 36615; phone: 251-438-3411; website: [http://www.continentalmotors.aero/Support\\_Materials/Publications/Service\\_Bulletins/](http://www.continentalmotors.aero/Support_Materials/Publications/Service_Bulletins/). You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Peter W. Hakala, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76193; phone: 817-222-5145; fax: 817-222-5785; email: [peter.w.hakala@faa.gov](mailto:peter.w.hakala@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposed AD. Send your comments to an address listed under the ADDRESSES section.

Include “Docket No. FAA-2007-0051; Directorate Identifier 2007-NE-37-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

### **Discussion**

On July 23, 2009, we issued AD 2009-16-03, Amendment 39-15986 (74 FR 38896, August 5, 2009), for certain Teledyne Continental Motors reciprocating engines with certain replacement PMA part numbers (P/Ns) of SAP cylinder assemblies installed. That AD requires initial and repetitive inspections and compression tests to detect cracks in those cylinders, with more than 750 flight hours time-in-service. That AD resulted from reports of cracks in the area of the exhaust valve and separation of cylinder heads from the barrels of SAP cylinder assemblies with certain P/Ns. We issued that AD to prevent the separation of the cylinder head, damage to the engine, and damage to the airplane.

### **Actions Since Existing AD Was Issued**

Since we issued AD 2009-16-03 (74 FR 38896, August 5, 2009), we became aware of supplemental type certificates (STCs) that modify CMI 470 series engines to accept CMI 520 or 550 cylinders. Those modified CMI 470 series engines could also have the affected P/Ns SAP cylinders installed. Therefore, those additional engines may suffer from the same unsafe condition that AD 2009-16-03 addresses.

We also changed the format for applicability from listing the affected models of CMI reciprocating engines in a table, to stating in a paragraph the affected reciprocating engine models. We made this change due to a comment that the AD was in error in listing the TSIO-520 engines, and that the applicability table did not list this model. The TSIO-520 model engines are, in fact, affected by the AD.

Also, since we issued AD 2009-16-03 (74 FR 38896, August 5, 2009), we became aware that determining the applicability of a cylinder might be difficult. We have added a paragraph to the proposed AD to clarify the identification of SAP cylinder assemblies. The paragraph expands what is in the existing AD by also looking for casting markings “CP” on the cylinder head. Operators can rely on the casting markings in determining if a cylinder assembly is affected, when the P/N on the bottom flange of the cylinder assembly is not visible.

We also changed the cost of compliance because the estimated population of engines with the SAP investment cast cylinders was revised from 8,000 to 6,000. Superior reported that the total production of the investment cast cylinders was only 34,487 cylinder assemblies.

#### **Relevant Service Information**

Continental Motors Aircraft Engine Service Information Letter SIL98-9B, Revision B, dated April 8, 2013, provides relevant service information for this AD. That service information also includes information concerning time-between-overhaul.

#### **FAA’s Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

### **Proposed AD Requirements**

This proposed AD would expand the list of applicable engines in AD 2009-16-03 (74 FR 38896, August 5, 2009), to include the CMI 470 series reciprocating engines modified by STC to accept CMI 520 or 550 cylinders, with certain replacement PMA SAP investment cast cylinder assemblies installed. This proposed AD would also clarify the identification of SAP cylinder assemblies.

### **Costs of Compliance**

We estimate that this proposed AD would affect 6,000 engines installed on airplanes of U.S. registry. We also estimate that it would take about 5 hours to replace a cylinder, and 15 hours per engine to inspect the cylinders. The average labor rate is \$85 per hour. Required parts would cost about \$1,200 per cylinder. We anticipate that 4,000 cylinders would require replacement. Based on these figures, we estimate the total cost of the proposed AD to U.S. operators to be \$14,150,000.

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## **Regulatory Findings**

We have determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by removing airworthiness directive (AD) 2009-16-03, Amendment 39-15986 (74 FR 38896, August 5, 2009), and adding the following new AD:

**Continental Motors, Inc. (formerly Teledyne Continental Motors, Continental):**

Docket No. FAA-2007-0051; Directorate Identifier 2007-NE-37-AD.

**(a) Comments Due Date**

The FAA must receive comments on this AD action by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

This AD supersedes AD 2009-16-03, Amendment 39-15986 (74 FR 38896, August 5, 2009).

**(c) Applicability**

This AD applies to:

(1) Continental Motors, Inc. (CMI) IO-520, TSIO-520, and IO-550 series reciprocating engines with replacement parts manufacturer approval (PMA) Superior Air Parts, Inc. (SAP) investment cast cylinder assemblies, part numbers (P/Ns) SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P, installed.

(2) All other engine models approved for the use of CMI 520 and 550 cylinder assemblies such as the CMI 470 series engines when modified by Supplemental Type Certificate (STC), with SAP investment cast cylinder assemblies, P/Ns SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P, installed.

(3) This AD applies to all serial numbers for the P/Ns listed in paragraphs (c)(1) and (c)(2) of this AD.

(4) If no SAP replacement cylinders were installed during engine maintenance since the CMI engines were new, then this AD does not apply.

**(d) Unsafe Condition**

This AD was prompted by the need to add to the applicability all other engine models approved for the use of CMI 520 and 550 cylinder assemblies such as the CMI 470 series engines when modified by STC, with affected SAP investment cast cylinder assemblies installed. We are issuing this AD to prevent the separation of the cylinder head, damage to the engine, and damage to the airplane.

**(e) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(f) Identification of SAP Cylinder Assemblies**

Seeing the SAP cylinder assembly P/Ns referenced in paragraphs (c)(1) and (c)(2) of this AD may be difficult because the assembly P/Ns are stamped on the bottom cylinder flange. Therefore, you may review the engine maintenance records instead of the steps listed in paragraphs (f)(1) and (f)(2) of this AD, to see if the engine records identify the P/Ns of the cylinders installed. If the records do not identify the P/Ns of the cylinders installed, do the following:

(1) Remove the valve cover from the cylinder assembly.

(2) Look at the top of the cylinder head for the casting markings “AMCAST” or “CP”. If a cylinder head has either of these markings, do the steps required by paragraphs (g) through (j) of this AD.

**(g) Initial Inspection of SAP Cylinder Assemblies**

For engines and cylinders listed in paragraphs (c)(1) and (c)(2) of this AD, with cylinders over 750 flight hours (FH) time-in-service (TIS) on the effective date of this AD, do the following initial inspection within 25 FH TIS.

(1) Inspect each cylinder head around the exhaust valve side for visual cracks or any signs of black combustion leakage.

(2) Replace any cracked or leaking cylinders before further flight.



(3) Perform a standard cylinder compression test. Guidance on standard cylinder compression tests can be found in Teledyne Continental Aircraft Engine Service Bulletin SB03-3, Differential Pressure Test and Borescope Inspection Procedures for Cylinders, dated March 28, 2003.

(i) If the cylinder pressure gauge reads below 60 pounds per-square inch, determine if the unacceptable pressure is due to a cracked cylinder.

(ii) To check the cylinder, apply a 2 percent soapy water solution to the side of the leaking cylinder.

(iii) If you see air bubbles, indicating air leakage, on the side of the cylinder head, or near the head-to-cylinder interface, replace the cylinder assembly before further flight.

**(h) Repetitive Inspections of SAP Cylinder Assemblies**

Thereafter, repeat the cylinder visual inspections and compression tests specified in paragraphs (g)(1) through (g)(3)(iii) of this AD, within every 50 FH time-since-last inspection until the cylinder reaches the TIS as listed in paragraph (i) of this AD.

**(i) Replacing SAP Cylinder Assemblies**

For installed cylinders, replace the affected SAP cylinders at the earliest of the following:

(1) When the cylinder reaches the operating hours TIS between overhaul limits, specified in Continental Motors Aircraft Engine Service Information Letter SIL98-9B, Revision B, dated April 8, 2013; or

(2) When the cylinder reaches 12 calendar years-since-installation.

**(j) Prohibition Against Installing Certain P/Ns of SAP Cylinder Assemblies**

After the effective date of this AD, do not install or reinstall after any removal, any SAP investment cast cylinder assembly, P/Ns SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P, in any engine.

**(k) Alternative Methods of Compliance**

The Manager, Special Certification Office, may approve AMOCs to this AD. Use the procedures found in 14 CFR 39.19 to make your request.

**(l) Special Flight Permits**

Under 14 CFR Part 39.23, we will not approve special flight permits for this AD for engines that have failed the visual inspection or the 50 hour periodic cylinder assembly compression test required by this AD.

**(m) Related Information**

(1) For more information about this AD, contact Peter W. Hakala, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76193; phone: 817-222-5145; fax: 817-222-5785; email: [peter.w.hakala@faa.gov](mailto:peter.w.hakala@faa.gov).

(2) For Teledyne Continental Aircraft Engine Service Bulletin SB03-3, dated March 28, 2003, and Continental Motors Aircraft Engine Service Information Letter SIL98-9B, Revision B, dated April 8, 2013, contact Continental Motors, Inc., 2039 Broad St., Mobile, AL 36615; phone: 251-438-3411; website: [http://www.continentalmotors.aero/Support\\_Materials/Publications/Service\\_Bulletins](http://www.continentalmotors.aero/Support_Materials/Publications/Service_Bulletins).

(3) You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Issued in Burlington, Massachusetts, on September 3, 2013.

Colleen M. D'Alessandro,  
Assistant Manager, Engine & Propeller Directorate,  
Aircraft Certification Service.

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